

Data Name
GENERAL SOURCES
Census of Agriculture
Agricultural Chemical Use Survey
Kynetec (Agricultural Usage)
Kline (Non-Agricultural Usage)
Specific Crop Usage/Crop Associations
National Association of State Departments of Agriculture

CEAP (Conservation Effects Assessment Program)

Pasture Usage

USFWS pesticide use permitting system (PUPS)

Individual State registrations
Department of Defense (DOD) Land
State Fish and Wildlife Offices
NPS pesticide use
BLM Pesticide use
Cranberry Pesticide Usage Survey Data

State Departments of Agriculture

APHIS - Wildlife Services - vertebrate control

APHIS - Plant Protection and Quarantine - grasshopper, fruit fly, gypsy moth, etc

APHIS - Veterinary Services

State Invasive Species Programs

EPA Sales report information

State sales report information

STATE SPECIFIC

NJ Pesticide Usage

CA Usage (PUR)

Arthropod Control Records on Public Lands in Florida

NY Pesticide Usage

MOSQUITO CONTROL ONLY

American Mosquito Control Association

Vector (Mosquito) Control Districts (aka Mosquito Abatement Districts), Vector Control within County Health Departments, Public Facilities Departments, or Environmental Departments

Florida Mosquito Coordinating Council

California Vectorborne Disease Surveillance System (CalSurv)

National Pollutant Discharge Elimination System (NPDES), Pesticide General Permit (PGP)

SUPPORTING INFORMATION

Cooperative Agricultural Pest Survey (CAPS) Program

Pest Tracker - exotic pest reporting (related to the CAPs Program)

State extension service recommendations

Center for Disease Control reporting and surveillance; ArboNET

Arthropod Pesticide Resistance Database

Water Quality Data Portal
National Water-Quality Assessment (NAWQA) Project
California – Surface Water Monitoring Database (SURF)
Oregon –Water Quality Monitoring Data (AWQMA)
Washington – Environmental Monitoring Data (EIM)
Terrestrial Monitoring - Water Quality Data Portal

Terrestrial monitoring - ECDMS

NOT RELEVANT TO MALATHION, BUT POTENTIALLY OTHER PESTICIDES

Indiana Private Applicator and Employees of Restricted Use Pesticides

Managed Forest Usage on USFS lands

State Forest Agencies: Idaho Department of Lands (Managed Forest Usage)

State Forest Agencies: Oregon State Department of Forestry; Oregon Department of Agriculture; Oregon Department of Environmental Quality (Managed Forest Usage)

National Alliance of Forest Owners (Managed Forest Usage)

State Departments of Transportation

NOT RECOMMENDED FOR FURTHER INVESTIGATION

Registrants (Applicants)

National Pesticide Information Center

Federal Highways (Right-of-Way Usage)

Golf Course Usage

State and County Usage
AgriSpire
Nursery Growers Associations (Nursery Usage)
Cattle Growers Association (Cattle Ear Tag Usage)
State Departments of Transportation (Right-of-Way Usage)

National Pollutant Discharge Elimination System (NPDES) individual permits for pesticide applications (covering actions that do not fall under the PGP)

Summary (Description of the data. Where available, include: geographic scope, granularity, if duplicative, years of coverage, level of effort to obtain)	Evaluation (Recommendation with brief justification based on summary information)
Information on land cover types in each state.	This data was provided as part of the SUUM. USDA is currently working to provide a custom report in which we can easily determine which crops are grown in each state.
Publicly available statewide data for 42 states, 90 use sites, and 731 a.i.'s from USDA/NASS. Data gathered approximately every other year.	Easily obtained direct usage data. Has been provided by USDA/EPA.
State-level data on 60 agricultural commodities for most of lower-48 states.	EPA provided data for malathion, chlorpyrifos, and diazinon for a period of 5 years, and is currently following up on the Services' request to receive the data on a more granular level and more information on the methodology underlying the reports for each chemical.
Market research report on consumer, turf, professional pest management, vegetation management, mosquito control, managed forest, developed, open space developed, Christmas tree, and nursery. Geographic scope, scale, and frequency of collection vary.	This data has been provided by EPA.
Data has not been gathered - see evaluation. Scale, relevance, scope, and level of effort will likely vary among crop associations.	May be worth pursuing information from some of the larger crop associations. The associations researched to this point did not gather usage data or have specific pesticide use recommendations, though a few had very general BMPs for pollinator/honey bee avoidance or spray drift reduction. FESTF indicated some of the larger organizations may have data or information which could be valuable. Action: Ask FESTF to make recommendations as to specific associations to contact and/or investigate further. Depending on the number of associations to be contacted/investigated, request FESTFs further assistance with information and data gathering.
Umbrella organization for State Department. May be able to facilitate requests to individual states or provide broadscale information. Specific data available is not yet known.	Recommend pursuing this source due to its potential to interact across states or provide widely applicable information.

<p>CEAP is a multi-agency effort to quantify the environmental effects of conservation practices and programs and to develop the science base for managing agricultural lands while promoting environmental quality and wildlife. Assessments in CEAP are carried out at national, regional, and watershed scales. Data presented in publicly available reports provides broad-scale information about dominant pesticides used, pesticide loss pathways, conservation practices/effectiveness, and agriculture information. The reports summarize pesticides used within large watershed basins that typically include parts of two or more states. NASS collects source data from periodic nationwide farmer surveys; this data is then rolled up and used in models of the basins for the CEAP reports.</p>	<p>CEAP Project Reports are readily available online. CEAP Farmer Survey data is not readily available on-line, but may be available from NRCS/NASS at a finer level of granularity that still complies with requirements to safeguard the privacy of all respondents, ensuring that no individual operation or producer can be identified, as required by Federal law.</p> <p>Recommendation: Pursue the NASS-CEAP survey data on pesticide usage. If pesticide a.i.s are listed in a basin report with those being used, consider this information as one of the indicators of pesticide usage in the basin. Obtain GIS data to map basin boundaries. NASS representatives were used to personally visit over 25,000 farms to collect the data nationwide, from July 2016-October 2016 to determine whether an operation qualifies for the survey. From October 2016-February 2017, those operations that qualified were visited to collect information about conservation practices. USDA's Natural Resources Conservation Service combined the data collected with information from its hydrologic, climate and soil databases to estimate environmental and management conditions for the areas surveyed.</p>
<p>The pasture cdl layer includes both agricultural (crops) and non-agricultural (grazing land) uses. Usage data for pasture-crops could be available from the same sources as for other agricultural uses. The non-ag pasture lands may be managed more like rangeland and treated for rangeland pests like grasshoppers/mormon crickets.</p>	<p>The Pasture category could be better defined. It may make sense to split this category into agricultural (pasture-crops) and non-agricultural (pasture-grazing?). Use and usage data/information for Pasture-crops could be pursued from the same sources as other agricultural crops, whereas, data for non-ag pasture uses may be more in line with rangeland uses. Recommend coordinating with FSTF regarding seeking data sources/data for Pasture uses.</p>
<p>Pesticide use on Fish and Wildlife Service lands. Location-specific, yearly information back to 2009 in an easily queried database. Contains all requests for use of a particular pesticide and indicate which requests resulted in use. Pounds applied and number of acres treated supplied.</p>	<p>Data for malathion had been obtained dating back to 2009.</p>

Individual states may have further restrictions on pesticide use than is reflected on the national label. Master labels for all three chemicals should reflect state level registration information.	After a discussion with FESTF, we will be asking registrants to provide us with this information. State or regional restrictions on use should be reflected in the master labels developed by the registrants and approved by EPA. Registrants should have easy access to this information.
The Army, Navy, and Air Force keep records/reports of all of their pesticide applications on their property. They each use a different system or format to record pesticide usage. A special request would need to be made from DOI to DOD to have access to these data.	Data should be obtained: The Department of the Interior or EPA should make a request to the Department of Defense to obtain the pesticide usage data from the Army, Navy, and Air Force.
State Fish and Wildlife Offices may make recommendations or have information on pesticide use (e.g. vector control) in areas that are potentially relevant to listed species (ie, sensitive areas). This information, if available, would vary by state, and would require contacting individual states to determine their policies and receive data. This information may be duplicative with other sources of information, for example, reporting of mosquito control applications.	Due to the high level of effort and uncertainty of the existence/usefulness of data, recommend not pursuing on a systematic basis. However, this information may be useful where it is already known to be collected (e.g. Oregon Fish and Wildlife) and may be worth pursuing in specific instances where listed species overlap with state managed lands or other areas considered sensitive.
The NPS maintains a Pesticide Use Proposal (PUP) database. PUPs are required prior to any pesticide use on National Park Service lands. The database is not publicly available; NPS staff must conduct the queries and develop reports.	Recommend pursuing due to it the ease of obtaining this data and the potential for sub-state data across all lands managed by NPS. An earlier query of all proposed malathion applications in Oregon conducted between 2016 and 2017 came back with 0 proposals/applications. Recommendation: Request malathion usage data for all years nationwide (in progress).
BLM maintains records of pesticide usage on BLM lands. The main uses of insecticides are for the grasshopper/mormon cricket control program and rangeland applications for control of leafhoppers associated with the curly top virus control program in California. Usage data are available at sub-state level: BLM Field Office area and possibly parcels within the FO area. Based on conversations with their IPM specialist, they have usage information dating back to there early 2000's. In CA the usage data may duplicative of Cal-PUR. The level of effort to retrieve these data would be low-medium.	Recommend pursuing due to it the ease of obtaining this data and the potential for sub-state data across all lands managed by BLM.
The Cranberry Institute maintains records on type of pesticides applied, method, timing, rates, and amount used. This data is available on a statewide basis. EPA has provided the PCT for states with cranberries for 2015 for diazinon in its SUUM and more detailed information for 2009 in the BE. The Cranberry Institute also provides information to its growers on pesticides available for use for 3 major sectors: Northeast, Northwest, Wisconsin.	Due to the small geographic scope of cranberry bogs in each state, statewide data can be indicative of usage across the entire crop in each state. Spoke with Terry Humfeld at Cranberry Institute and he is following up to see what information is currently available that he can release to us.

Usage data collected by individuals states. Scope, number of years, and uses covered will vary from state to state. Effort to collect is high (ie, contacting individual states) but potentially valuable source of state-specific information where available.	Given the high potential for directly useful information, we are working through FESTF to contact individual states for data. As of 6/15/18, FESTF has made contact with about half of the states.
APHIS uses pesticides for vertebrate control and may keep records of such use, or recommendations/restrictions on which pesticides may be used.	This program is less likely to use insecticides but may be a more relevant source for future consultations. USDA is currently contacting APHIS to obtain more information, including the availability of usage records.
APHIS uses pesticides for plant protection and quarantine (e.g. Cattle Fever Tick Program) and may keep records of such use, or recommendations/restrictions on which pesticides may be used.	USDA is currently contacting APHIS to obtain more information, including the availability of usage records.
APHIS uses pesticides for eradication and control programs (e.g. gypsy moth, boll weevil, imported fire ant) Cattle Fever Tick Program) and may keep records of such use, or recommendations/restrictions on which pesticides may be used. May be duplicative of where pesticides are used on certain federal lands where pesticide use is otherwise tracked (e.g., BLM).	USDA is currently contacting APHIS to obtain more information, including the availability of usage records.
State invasive species programs are useful to identify pest/invasive species of concern within a state and efforts to prevent, control, and eradicate. Information is housed with multiple agencies and in various formats. NISIC (https://www.invasivespeciesinfo.gov/unitedstates/state.shtml) provides links to state specific information, including: <ul style="list-style-type: none"> •Items of Interest •State Specific Threats •Find Experts •Council or Task Force •Partnership •Federal Government •State Government •Academic . Invasive species councils are a good starting point to ascertain pest/invasive issues of concern, but identifying methods of control are not easily obtainable.	Use this information to identify pests/invasive species of concern and whether the pesticide is used as a control and/or eradication method. This information would have a high level of effort to obtain, but may be useful on a case by case basis.
This report provides summary information on pesticides sales in U.S. dollars by producers, expenditures by users by pesticide type (e.g., herbicide, insecticide), expenditures by user group (Ag, Ind/Comm/Gov, Home and Garden), and pesticide usage data (in lbs used) for both pesticide type and user group at the national level. More specific use data (state level, county level) is not provided in this report. The 25 most commonly used pesticides in a given year is reported out.	Overall, this report provides good pesticide summary information at the national level, but is not specific enough to inform pesticide use at the state or county level. May give insight into general trends of use for a particular a.i. (e.g. agriculture vs residential use).

State sales data available for California, Hawaii, and New York, possibly other states. Granularity and reporting requirements vary by state. Some states only require reporting of Restricted Use Pesticides (RUPs).	Recommend pursuing this information; may be most useful for states and territories where sales are most likely to indicate usage within the state (HI and Pacific island, Puerto Rico, US Virgin Islands, Alaska). Ask registrants if they can provide this information for these specific states/territories.
Data is for New Jersey only and is available by county, but is not pesticide specific. NJDEP surveys all licensed pesticide users in the state every three years, though all surveyed uses are not on the same three-year cycle. Data is available from 1985 through 2014 (some uses do not cover this entire time period). Data through 2017 is being compiled and should be available by the end of the summer. Pesticide applicators are required to respond to the survey, leading to a very high response rate (varies by use, but typically over 90%). A large range of use types are covered: agricultural, right-of-ways, mosquito control, structural, golf course, lawn care and aquatic. Data collected includes the total amount of chemical used, by use type (lbs. a.i.) - state scale; total amount of all pesticides applied to a specific crop type - state scale; total amount of all pesticides applied in each county by use type. County scale usage data only gives total lbs. of pesticide applied in that county, does not break down by chemical. Low level of effort to collect data as it is publicly available online.	Data should be obtained: could be useful in presence/absence of use for entire state (such as no right-of-way use for all three chemicals) or by county (such as no malathion use reported in Essex county). High survey response rate covers up to 90% of applicators/growers. Action: NJDEP contacted and staff are looking into the possibility of county scale pesticide specific usage data. Data through 2017 will be available by the end of the summer.
Active ingredient usage data by use (lbs applied). County and subcounty scale data available for agriculture and non-agriculture uses. Possibly duplicative with Kynetec version of these data.	Use these data for California. Most data is available for Sections, but all data is available at County level. Acres treated not always available for all uses.

<p>Publicly owned lands determined to have environmentally sensitive or biologically highly productive land must have an arthropod control plan. Scale is management area specific ranging from less than acre to over 160,000 acres, methods and plans for vector control are generally arrived at by consensus with the corresponding county(ies) mosquito control district(s) but management objectives may differ, the level of effort to obtain and compile the individual land management plans for every parcel of public land is high, years of coverage for the plans span 10 years and records of pesticide use are retained for at least 5 years.</p>	<p>In the limited number of reviewed arthropod control plans for FFWCC lands, malathion did not appear as an approved pesticide for larvicide or adulticide use. Because of the potential to remove or maintain large portions of the action area for Florida, especially where we may not otherwise have usage data, recommend pursuing these plans.</p>
<p>Non-duplicative and sub-county scale usage data reported by zip code by commercial applicators. A NY commercial applicator license is required for Agricultural and animal pest control, Forest pest control, Ornamental and turf pest control, Seed treatment., Aquatic pest control, Rights-of-way pest control, Industrial, institutional and structural pest control, Public health pest control, Regulatory pest control, Demonstration and research pest control, Aerial pest control, and Sales. For more details see: https://govt.westlaw.com/nycrr/Document/I4ea98fd5cd1711dda432a117e6e0f345?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)</p>	<p>Use this data to confirm chlorpyrifos, diazinon, and malathion usage in NY State. Suggest using this data in conjunction with species range maps and CDL layers. For 2013 to 2016, pounds of active ingredients applied is available by zip code.</p>

<p>National professional association that advocates for an IPM approach to mosquito control , and promotes public education and provides leadership. Members comprised of public health professionals, county/local government, state public health reps, academics, and industry. Source of information for understanding where MA use occurs across the country. Data available and effort to obtain will be determined in future discussions with AMCA.</p>	<p>AMCA may be able to provide expertise in limiting the action area for mosquito control, or facilitate access to usage data from its members. Interagency group met with AMCA which expressed its willingness to help with these tasks.</p>
<p>Scale, relevance, scope, and level of effort will likely vary among mosquito control districts, and county/municipal departments that perform vector control.</p>	<p>Individual programs may have usage data or other recommendations that would provide sub-state information for multiple years. Recommend pursuing this data.</p>
<p>Pdf reports are available with summary data on aerial adulticiding, ground applications, and larviciding. Information is broken down by a.i., gallons applied per county, and acres per county. Most recent report available online is for 2014. Information is not duplicative, and years of coverage will vary depending on when an individual mosquito control district was approved and began reporting.</p>	<p>58 of the 67 counties in FL have a F.S Chapter 388 state approved mosquito control program. Pdf reports are available with summary data on aerial adulticiding, ground applications, and larviciding and provide actual usage data on a county-wide basis. Recommend pursuing this data, including seeking out more recent information.</p>
<p>GIS database where mosquito control districts report information about mosquito pools, disease in humans, sentinel chickens. Used to estimate areas of disease risk and used to prioritize areas for vector control. The scale of data is statewide, is non-duplicative, and there are records dating back at least to 2003 online. This online database of California's arbovirus monitoring and detection in dead birds, sentinel birds, and mosquito pools is likely to continue for many years.</p>	<p>Recommend pursuing data as it appears to have geospatial data on a sub-state level.</p>

<p>Applicators applying pesticide for mosquito and other flying insect pest control (near water) and forest canopy pest control (near water) are required to be covered by an NPDES permit, i.e. pesticide general permit (PGP). For states where EPA issues NPDES permits (Idaho, Massachusetts, New Hampshire, New Mexico, and Washington D.C., and some federal lands in other states) applicators are required to submit a NOI for coverage under EPAs national PGP. Applicators in other states need to seek coverage under the state PGP. Information required in the NOI includes type of use, location where treatment is planned to occur, the pesticide, and othe use information. EPA maintains a database of NOIs for applicators seeking coverage. EPA began requiring coverage in 2011, when the first National PGP was issued.</p>	<p>The National (EPA) PGP would contain a subset of mosquito control and forest canopy pesticide application plans for the limited number of states. Records will contain descriptions of the usage areas (sub-state) and may include maps (polygons). The 2011 PGP had 581 records and the 2016 PGP has around 230 records. This will be a good source to supplement use/usage from states and/or mosquito control districts. There are also State PGPs that could be investigated. Action: recommend reviewing PGP records to supplement usage information from other sources.</p>
<p>The CAPS program targets specific exotic plant pests, diseases, and weeds identified as threats of regulatory significance to U.S. agriculture and/or the environment. Efforts focus on early detection and surveillance activities. This data informs and works in concert with the PPQ program to provide quarantine information with maps, and develop management strategies can include pesticide use. For some species, more extensive potential range maps are also available to promote early pest detection and control measures. While usage data is not available through this program, current and potential future pest pressures are identified for target species with coinciding geographical areas and recommended pesticide uses for some pests.</p>	<p>Recommendation: Review management plans for target species where malathion and chlorpyrifos have been recommended, and map current and anticipated pesticide use sites within the pest ranges.</p>

<p>Pest Tracker supports the APHIS CAPs and PPQ programs and serves as a place to get information about various priority pests.</p>	<p>This information can be used in concert with information from the APHIS CAPs and PPQ programs. The website is a place to look up Federal quarantine areas by state, and leads to additional information about state quarantines. Information about high priority pests is available, including some that are not on the PPQ site. It may be useful for tracking pest pressures and occurrences, and to learn more about the identified high priority pests. Recommendation: Do not pursue data from this source except to determine if further information is available on pest ranges and quarantine areas for CAPs target species where malathion and chlorpyrifos have been recommended.</p>
<p>Recommendations by individual states/extension services for specific use of an a.i. Scope, number of years, and uses covered will vary from state to state. Effort to collect is high (ie, contacting state or county offices).</p>	<p>May be valuable supporting information in areas where no usage data is available. Recommend for FESTF assistance.</p>
<p>CDC collects, tracks, and reports confirmed cases of arbovirus disease in humans. ArboNET is an online portal the public can easily query by arbovirus disease type and infected animal (human cases, sentinel birds, and veterinary cases). ArboNET records date from 2003 to present; however not all counties have records for all parameters dating back to 2003 which is a limitation of the database. Both of these data sources are the national authoritative source of information for vectored disease information. Some of the information such as human arbovirus disease may be duplicative with state and county health department records.</p>	<p>Easily obtained and may have value in determining the geographic scope of where vector based disease may require pesticide treatment.</p>
<p>The Arthropod Pesticide Resistance Database is available to the public on-line through Michigan State University. It serves as a clearinghouse for pesticide resistance events worldwide, from 1908 to the present. Reports of resistance can be searched by pesticide active ingredients, pests, country and other fields; USA reports list states in query results with links to further details that can include more localized information.</p>	<p>Many resistance cases involve organophosphates. This information could potentially be useful in determining or projecting pesticide use and usage patterns if geographical areas could be depicted with the coinciding responses to resistance concerns (i.e., changes in usage of specific pesticides). Recommendation: Determine whether or not the APRD could help inform projections about pesticide usage patterns by checking with those familiar with the application of this data.</p>

Publicly available site that includes pesticide detection in soil, sediment, surface and ground water as well as tissue with location information. In addition it will provide the entity that collected the data (not limited to EPA STORET and USGS NAWQA; also includes, academia, tribes, and state or local governments). May involve some manipulation of the data once downloaded to provide a complete result of where (lat,long) pesticide detection in samples took place.	Easily accessible and mapped; recommend obtaining
Very useful supportive monitoring data on pesticide presence in water bodies but is not site specific at a scale more refined than state level. Data available from 1992-2015. Excellent for showing general trends over time.	publicly available site that provides useful supportive monitoring data on pesticide presence in water bodies but is not site specific at a scale more refined than state level. Data available from 1992-2015. Excellent for showing general trends over time.
Publicly available database that provides location information for surface water detection of chemicals throughout the state of California. Provides site description, lat, long, MDL, LOQ of sample, sample type, etc. Similar data to the national water quality monitoring council database. Probably some overlap with site ids from the national. Can be used to coincide with Cal DPR info on pesticide usage.	Very useful publicly available database that provides location information for surface water detection of chemicals throughout the state of California. Provides site description, lat, long, MDL, LOQ of sample, sample type, etc. Similar data to the national water quality monitoring council database. Probably some overlap with site ids from the national. Can be used to coincide with Cal DPR info on pesticide usage.
Publicly available database that provides location information for surface water detection of chemicals throughout the state of Oregon. Can be used to crosswalk with National Data Quality Monitoring Database using activity identifier (spreadsheet column from record download) for info on pesticide usage.	Very useful publicly available database that provides location information for surface water detection of chemicals throughout the state of Oregon. Can be used to crosswalk with National Data Quality Monitoring Database using activity identifier (spreadsheet column from record download) for info on pesticide usage.
Publicly available and provides location information for surface or groundwater detection of chemicals in the state of Washington. Can be used to crosswalk with National Data Quality Monitoring Database using activity identifier (spreadsheet column from record download) for info on pesticide usage. Provides site description, lat, long, MDL, LOQ of sample, sample type, year, etc.	Similar to the Oregon water quality monitoring database that it is publicly available and provides location information for surface or groundwater detection of chemicals in the state of Washington. Can be used to crosswalk with National Data Quality Monitoring Database using activity identifier (spreadsheet column from record download) for info on pesticide usage. Provides site description, lat, long, MDL, LOQ of sample, sample type, year, etc.
Publicly available site that includes pesticide detection in soil, sediment, surface and ground water as well as tissue with location information. In addition it will provide the entity that collected the data (not limited to EPA STORET and USGS NAWQA; also includes, academia, tribes, and state or local governments). May involve some manipulation of the data once downloaded to provide a complete result of where (lat,long) pesticide detection in samples took place.	Easily queried and appears to contain a small number of detections for malathion.

Database of contaminant analysis records that have been performed through the USFWS Analytical Control Facility. Media tested are varied and include tissue, soil, and water. Depending on chemical, data may be no more recent than 2013. Each record contains lat/long information. Easily queried and mapped.	This data is easily obtained and may contain unique locations or matrices (e.g., animal tissue or terrestrial substrates). A spreadsheet was obtained.
The Office of the Indiana Chemist requires that private applicators or employees keep records of Restricted Use Pesticide (RUP) applications. This information is maintained in the records of the applicators and collected only upon request by Indiana State Chemist. Examples given for reasons these records might be requested include medical treatment of an individual that may have been exposed, or complaint/damage investigation. Records are required to be kept for 2 years. Obtaining the data, if possible, would likely require a request of each privator applicator in cooperation with the State of Indiana.	Given the high effort in collecting the data, the limit to restricted use pesticides, and the limited number of years available from each source, recommend not pursuing data from this source at this time, but could be worth investigating further in specific instances where information for a relevant pesticide/species combination is lacking. Malathion is not a restricted use pesticide.
Not a malathion registered use. Covers only a handful of years and acreage within a Forest but more granularity on location not available.	Publicly available but not easily obtained, required some additional searches, may not be available for every Forest Service Region.
Not a malathion registered use.	
Not a malathion registered use.	
Not a malathion registered use.	

<p>A search of state DOTs found that "Vegetation Management Guides" are common and often contain sections on the control of insects as well. Level of effort is high as individual state DOTs would need to be contacted to see if they maintain records. Data is expected to be state-specific; details are likely to vary among states.</p>	<p>Since right-of-ways are more likely to be treated with herbicides than insecticides, information may be valuable in ruling out areas where there is no use. Due to high level of effort, recommend for FESTF. However, since malathion is not registered for this use, this is a lower priority.</p>
<p>Met with three major registrants of chlorpyrifos, diazinon, and malathion who identified which sources may be most suitable to gather information from, but did not provide any new sources of data. Registrants indicated that they can help evaluate how these products are used.</p>	<p>Registrants do not appear to be a separate source of usage data but are willing to help obtain data through FESTF and other means.</p>
<p>The website links to other agency's websites (EPA, USDA, USGS) to find statistics for pesticide usage in the U.S. Links to pesticide usage are already outlined as other line items in this spreadsheet. One link of interest is the USDA Crop Profiles. Crop profiles are descriptions of crop production and pest management recommendations compiled by state and commodity. Available at: http://www.northeastipm.org/ipm-planning/crop-profiles/</p>	<p>Pesticide use data is not available on this website.</p>
<p>Federal Highways was contacted and indicated that they do not maintain records on pesticide use or recommendations. Suggested contacting individual state DOTs.</p>	<p>This source does not appear to maintain relevant data and should not be pursued further.</p>
<p>Malathion is not registered for use on golf courses. No publicly available usage data was found. [Note: It is possible that mosquito adulticide may be used on golf courses; see information specific to adulticides.]</p>	<p>Malathion is not registered for use on golf courses. Publicly available pesticide usage data specific to golf courses was not found. A survey sent to 16,194 golf facility superintendents (with a 20.5% response rate) was done "to determine pesticide use and investigate pesticide use practices and pest management tactics on golf courses in the U.S. and its agronomic regions. The pesticide use data proved to be too unreliable to confidently report the use of individual pesticide active ingredients by specific components of the golf course (greens, tees, fairways, rough)." Specific a.i.s were not mentioned in the report, although pesticides are commonly used on golf courses. "Almost all golf facilities employed one or more certified pesticide applicators" (GCSAA 2012). The Golf Course Superintendents Association of America (GCSAA) encourages IPM plans for golf courses and they do provide guidance (GCSAA 2009); surveys showed that written IPM plans were significantly more common on 27-hole (41%) and 18-hole (41%) golf facilities than 9-hole (33%) golf facilities (GCSAA 2012). Many golf course facilities likely collect and store their own pesticide usage data, so various data is likely available but it would need to be requested on a site-by-site basis. Recommendation: Do not pursue.</p>

Usage data collected by individuals states. Scope, number of years, and uses covered will vary from state to state. Effort to collect is high (ie, contacting individual states) but potentially valuable source of state-specific information where available.	Given the high potential for directly useful information, we are working through FESTF to contact individual states for data. As of 6/15/18, FESTF has made contact with about half of the states.
This source was noted by USDA. The database includes pounds applied and total expenditures for the top 10 AI's by type and crop - based primarily on sales data from registrants. It includes national pesticide usage data only. It would appear that there is a fee for obtaining a license and that the data are proprietary. USDA had a license for AgriSpire but has since replaced it with Kynetec.	USDA recommended not pursuing this source. Usage data are only available at the national-level, would likely be duplicative of other sources (Kynetec), would require a license (fee). Action: recommend not pursuing this source.
No available data was found - see Evaluation column	Did not find information or data worth pursuing: there are numerous national and state level nursery and horticultural associations - the ones I looked at (about 15 national level and 6 state level) did not have usage data for the industry or pesticide use recommendations. Some websites referred to state Extension services for use recommendations (this should be covered under a separate task).
Cattle ear tags are used to keep flying/biting insects away from cattle faces. Chlorpyrifos and diazinon are registered for use in cattle ear tags. It is recommended to rotate between pyrethroid and organophosphate types of ear tags each year to help prevent resistance buildup.	Malathion is not registered for use in cattle ear tags. For chlorpyrifos and diazinon, suggest assuming that cattle ear tags are being used on cattle where cattle are grazed.
A search of state DOTs found that "Vegetation Management Guides" are common and often contain sections on the control of insects as well. Level of effort is high as individual state DOTs would need to be contacted to see if they maintain records. Data is expected to be state-specific; details are likely to vary among states.	Since right-of-ways are more likely to be treated with herbicides than insecticides, information may be valuable in ruling out areas where there is no use. Due to high level of effort, recommend for FESTF. However, since malathion is not registered for this use, this is a lower priority.

This data includes individual NPDES permits issued for point source pesticide discharges to waters of the U.S. that do not fall under the NPDES Pesticide General Permit (PGP). Data is housed at the EPA and with states that have delegated authority to implement the NPDES program within their jurisdictions. EPA and some states have publicly available databases that can be searched for NPDES permits online, although each has a different search engine and they can be difficult to use for those not familiar with the systems. Much of the data can only be obtained by requesting it from the various state offices. Initial inquiries indicate that very few permits have been issued outside of the NPDES PGP. The NPDES PGP was intended to cover the vast majority of pesticide uses that would require an NPDES permit.

When EPA developed the PGP, their aim was to cover all of the primary pesticide uses that would require an NPDES permit. While there may be some instances where individual permits are required for activities that fall outside of the scope of the PGP, this seems likely to be a rare occurrence. In response to an inquiry 5/31/18, EPA staff were only aware of one NPDES individual permit issued for pesticide use outside of the 2011 and 2016 PGPs (Jennifer Chan, EPA, pers. comm. May 2018). An inquiry to NPDES staff in Florida found none, and they are unaware of uses that are occurring in that state that would not be covered by the PGP (Mary Smith, Florida Department of Environmental Protection, pers. comm. June 2018). A search of California's NPDES regulated facilities for pesticide application involving both active and terminated permits found 0 facilities regulated by an Individual Action, and 34 regulated by a General Order (under NPDES permits for "Aquatic Pesticide Vector Control" or "Aquatic Pesticide Weed Control," with the exception of one historical permit listed as "null" (6/5/18 online search of California State Water Resources Control Board Regulated Facilities). Publicly available information about NPDES individual permits varies by geographical area, and is not always readily available or easy to query. Over time, this is likely to improve due to a 2015 NPDES Electronic Reporting Rule that could lead to a single clearinghouse for EPA and state NPDES electronic permit reports. However, while it may be possible to obtain some pesticide usage data related to NPDES individual permits, it is not anticipated that there will be many, and they may not provide the level of granularity, geographic coverage, completeness or ease of gathering that would make it worth the effort to obtain them. Recommendation: Do not pursue.

Pursue this source of data?	Has data been obtained? Describe status.	Data Developer	License Owner
Yes	Yes; requested custom report from NASS	USDA/NASS	publicly available
Yes	Yes	USDA/NASS	publicly available
Yes	Yes; requested more information from Kynetec	Kynetec (proprietary)	EPA, USDA has 2017 data
Yes	Yes	Kline (proprietary)	EPA
Yes	No; recommend for FESTF assistance	Crop Associations (TBD)	
Yes	No; USDA (David Epstein) is currently reaching out to this organization.		

Yes	No; reached out to USDA for assistance in determining whether unique from other NASS reporting. Farmer surveys related to CEAP appear to be unique from NASS. Survey forms completed in the field by NASS representative vs. mailed.	USDA/NRCS/NRI and NASS	USDA/NRCS
Yes	In progress	APHIS	N/A
Yes	Yes	FWS	FWS

Yes	No; recommend seeking assistance of registrants	States	States
Yes	No; requires an official request from agency/department	Armed Forces Pest Management Board (AFPMB)	Armed Forces Pest Management Board (AFPMB)
Yes, on a case by case basis	No; can evaluate need for this data in pilot states	individual state offices	
Yes	In progress; request has been made for all malathion data	NPS (Contact: James Howard, james_c_howard@nps.gov, 970-267-2130)	NPS
Yes	Yes	BLM	
Yes	In progress; Cranberry Institute has provided its 2018 Pesticide Charts to us and is currently checking to what usage data is available for release	Cranberry Institute	Cranberry Institute

Yes	In progress - as of 6/15/18, FESTF had made contact with about half of all states	Individual States	Individual States
Yes	No; USDA is currently following up		
Yes	No; USDA is currently following up		
Yes	No; USDA is currently following up		
Yes, on a case by case basis	No; can evaluate need for this data in pilot states	Many different agencies	
Yes	Yes		

Yes	In progress; HI and Cal obtained, HI only for RUPs (i.e., no malathion data)	California Department of Pesticide Regulation and NY State Dept. of Environmental Conservation	California and NY- publicly available
Yes	Yes; NJDEP staff are looking into the possibility of county scale pesticide specific usage data	NJDEP: contact Anne Rush, anne.rush@dep.nj.gov	publicly available
Yes	Yes	CADPR	publicly available, USDA has Kynetec-based platform that expedites queries and has newer data than what is online (2018)

Yes	No	Public Land Management Agencies managing lands in Florida	Florida Public Land Management Agencies/ Florida Mosquito Control Districts
Yes	Yes	NYSDEC	publicly available

Yes	In progress; met with AMNC and submitted an information request		N/A
Yes	No	State, County, Municipal Mosquito Control Districts	State/County governments (varies?)
Yes	No	individual state-approved MCDs	Florida Mosquito Coordinating Council. Contacts: Program Area Lead: Adriane Rogers , 850-671-7929, Adriane.Rogers@FreshFromFlorida.com or Eric LeVeen, 850-617-7936, Eric.LeVeen@FreshFromFlorida.com. Public Records Liaison: Angela Weeks-Samanie, 850-617-7911, Angela.Weeks-Samanie@FreshFromFlorida.com Technical Contact: Eric LeVeen, 850-617-7919, Eric.LeVeen@FreshFromFlorida.com
Yes	No	University of California at Davis	State

Yes	No	EPA	EPA
Yes	No; have contacted USDA to set up a discussion on the utility of this source	APHIS	APHIS

Yes	No; have contacted USDA to set up a discussion on the utility of this source	APHIS, partners	APHIS
Yes	No; recommend seeking assistance of FESTF	individual states and counties	
Yes	No	Center for Disease Control and State health departments	CDC
Yes	No; have contacted USDA to set up a discussion on the utility of this source	Michigan State University with support from the Insecticide Resistance Action Committee (IRAC, specialist technical group of Crop Life International since 1984) and USDA.	Michigan State University with support from IRAC, USDA and other partners

Yes	Yes		
Yes	Yes	USGS	USGS; publicly available
Yes	No	California Department of Pesticide Regulation	California - publicly available
Yes	No	State of Oregon - Department of Environmental Quality	Oregon - publicly accessible
Yes	No	Washington State Department of Ecology	Washington State - Publicly available
Yes	In progress		

Yes	Yes	USFWS	
Yes		Indiana Private Applicators	Private Applicators
Yes		USFS Regional offices (Region 5 example in link)	USDA/USFS
Yes		State Forest Agencies: Idaho Department of Lands	?
Yes		State Forest Agencies: Oregon State Department of Forestry; Oregon Department of Agriculture; Oregon Department of Environmental Quality	?
Yes		National Alliance of Forest Owners	?

Yes		Individual States	Individual States
No			
No			
No		Federal Highway Administration	
No		Golf Course Superintendents Association of America (GCSAA) promotes IPM plans and advocates for pesticide use, but no specific pesticide recommendations or pesticide usage data is available.	N/A

No		State/County Agriculture Extension Offices	
No		Phillips McDougall	USDA was a previous license owner but dropped it for Kynetec
No		Nursery Growers Associations	N/A
No		Cattle Growers Association	N/A
No		State Departments of Transportation	

No		EPA and states	EPA and states

Explanation
Every 5 years
Approximately every other year
Market research report
Market research report

In 2003-2006 NRCS surveyed farmers nationally in 16 different CEAP (Conservation Effects Assessment Project) subregions. Reports on 12 subregions are now available. A 2016 survey is anticipated to provide more recent data in the near future. CEAP cropland reports for 12 basins indicated that chlorpyrifos has been used in the Upper Mississippi River Basin, Great Lakes Region, Ohio-Tennessee River Basin, Arkansas-White-Red Basin, Pacific Northwest Basin, South Atlantic Gulf Basin, Souris-Red-Rainy Basin and Delaware River Basin; malathion has been used in the Lower Mississippi River Basin and Texas Gulf Basin; and uses of diazinon, chlorpyrifos and malathion either did not occur or did not occur at high enough levels to be specified for the Chesapeake Bay Region and Missouri River Basin. Pesticides listed for each region were based on pesticide use information from the CEAP survey conducted in 2003-06 (active ingredient, application rate, application method, and time of application). NASS conducts the surveys in support of CEAP by interviewing a randomly selected set of cooperating farmers nationwide to obtain current information on farming practices (e.g., crops grown, tillage practices, nutrient and pesticide application, conservation practices) at National Resources Inventory (NRI) statistical sample points. This farmer survey data is used in field-level physical-process models to assess the effects of conservation practices on cropland. Additional data may be available through these survey efforts that would provide more details about pesticide usage than the broad-level information included in the watershed reports. In addition, more recent data may be available. A 2016 NRI - CEAP survey was developed (status?) to collect information from farmers and ranchers to more accurately measure the environmental benefits associated with implementation and installation of conservation practices on agricultural land. NASS representatives planned to visit nearly 25,000 farms nationwide to interview farmers about production practices including: 1) Chemical, fertilizer and manure applications; 2) Integrated pest management; 3) Installed conservation practices; and 4) Land and water use decisions.

This element is intended to better understand/define the Pasture category. Some of the underlying CDL layers for Pasture are crops, ie alfalfa, hay, other grasses. For those layers, use and usage data may be available from the same sources that are being pursued for other agricultural crops/uses. The other Pasture layers include uses where no crops are planted but grazing occurs. Use and usage data for these layers may be more difficult to track down. Will coordinate with FSTF regarding seeking data sources/data for Pasture uses. [note - it may make sense to disaggregate the Pasture cdl layer into Pasture-crops and Pasture non-ag.

FWS requires submission of a Pesticide Use Proposal (PUP) prior to any pesticide use on Service lands, including invasives control and farmed areas. These requests are stored in a database dating back to 2009.

State registrations are maintained by the states in various systems and databases. Often, this function is part of the State Department of Agriculture, but may be part of other state offices such as the Department of Environmental Protection.

The Army, Navy, And Air Force keep records/reports of all of their pesticide applications. They each use a different system or format to record pesticide usage. A special request would need to be made from DOI to DOD to have access to these data.

May make recommendations or have information on pesticide use (e.g. vector control) in areas that are potentially relevant to listed species (ie, sensitive areas). Example: Oregon Department Fish and Wildlife recommends that "organophosphates should be used for adult mosquito control only when needed to contain an existing health threat and in coordination with ODFW." ODFW requests yearly reporting of treatments on identified sensitive areas that deviated from their general guidance.

The NPS requires submission of a Pesticide Use Proposal (PUP) prior to any pesticide use on National Park Service lands. These requests are stored in a database at the NPS.

Survey data regarding pesticide usage on cranberry production in the United States

Many States have data on where crops are grown within that state. Some states have compiled pesticide usage data, particularly for crops of economic importance to the state.

Useful "check" for comparison to usage data.

NJDEP surveys all licensed pesticide users in the state every three years (not all surveyed uses are on the same three year cycle). Pesticide applicators are required to respond. A large range of use types are covered: agricultural, right-of-way, mosquito control, structural, golf courses, lawn care, and aquatic.

pesticide usage for each square mile section of California and at the county levels for some uses.

State of Florida implementing regulations (5E-13.042 Criteria for Arthropod Control That May Affect Environmentally Sensitive and Biologically Productive Public Lands and Other Public Lands.) to implement state law Section 388.4111, F.S., by establishing the procedures to be followed to implement arthropod control plans on environmentally sensitive and biologically highly productive public lands. The arthropod control plan is a one component of a conservation land management plan. The land management plan also includes information on forest management, wildlife resources, exotic and invasive species control, hydrological classification and restoration or conservation practices, historic and current land uses on the property and conflicting land uses adjacent. Land management plans for Wildlife Management Areas and Wildlife and Environmental Areas are publicly accessible through the Florida Fish and Wildlife Conservation Commission's website; however, not all posted management plans have the appendices. The Arthropod Control Plans are located in the appendices. All management plans of public lands in Florida must be approved by the Board of Trustees of the Internal Improvement Trust Fund or their designated agent, ie, the Division of State Lands, Office of Environmental Services. \

Certified Commercial Applicators, Technicians, Aquatic Anti-Fouling Paint Applicators and Commercial Permittees (including Importers, Manufacturers and Compounders) are required to submit the annual pesticide usage reports.

Reporting of pesticide usage for control of adult or larval mosquitoes within mosquito control districts throughout the US
Florida State law requires the establishment of the Florida Coordinating Council on Mosquito Control so "that public agencies responsible for and involved in arthropod control activities work together to reduce duplication of effort, foster maximum efficient use of existing resources, advise and assist the agencies involved in arthropod control in implementing best management practices and best available technology in controlling arthropods, develop outside funding sources and establish priorities for research into the environmental effects of arthropod control, and enhance communication between all interests involved in arthropod control activities." Included are: USEPA, USFWS, executive director of the Fish and Wildlife Conservation Commission.

EPA issued a NPDES Pesticide General Permit (PGP) that is available to Operators who discharge to Waters of the United States from the application of (1) biological pesticides or (2) chemical pesticides that involve point source discharges that leave a residue (collectively called pesticides), when the pesticide application is for one of the following pesticide use patterns: Mosquito and other flying insect pest control; Weed and algae pest control; Animal pest control; Forest canopy pest control. EPA and the states issue PGPs to offer coverage for pesticide operators. The agency that issues an NPDES permit for discharges from pesticide applications depends on the location of those applications. In most cases, the state environmental protection regulatory agency (e.g., the Department of Environmental Quality or Department of Natural Resources) is the NPDES permitting authority and issues the NPDES permits for activities in their state. EPA issues the PGP only for areas and activities where the states are not authorized. Specifically, EPA is the NPDES permitting authority for pesticide discharges in: Idaho, Massachusetts, New Hampshire, New Mexico, and Washington D.C.; all U.S. territories except the Virgin Islands; activities associated with oil, gas, or geothermal resources in Texas; Federal facilities in Delaware, Vermont, Colorado, and Washington, and; all Indian Country except in Maine.

The CAPS program conducts science-based national and state surveys targeted at specific exotic plant pests, diseases, and weeds identified as threats of regulatory significance to U.S. agriculture and/or the environment. Efforts focus on early detection and surveillance activities. Most activities receive USDA funding provided through cooperative agreements with state departments of agriculture, universities, and other entities. APHIS Plant Protection and Quarantine (PPQ) responds to many new introductions of plant pests to eradicate, suppress, or contain them through various programs in cooperation with state departments of agriculture and other government agencies. These may be emergency or longer term domestic programs that target a specific regulated pest. Management strategies can include pesticide use. For example, plans addressing these pests specify recommended uses of malathion (fruit flies, grasshopper/Mormon cricket, gypsy moth), chlorpyrifos (fire ant, cotton pests, gypsy moth, pine shoot beetle, palm weevils) and diazinon (fire ant, fruit flies). Information about quarantine areas for each species is available online. For some species, more extensive potential range maps are also available to promote early pest detection and control measures. While usage data is not available through this program, the information may be useful in identifying current and potential future pest pressures and pesticide uses.

Pest Tracker is on the APHIS web site, and can be used to look up states have federal quarantines, or that could make a good home for the targeted pests. It also leads people to information about state-level quarantines that might apply. Information about the pests and contacts are also provided. Some of the pests included on this site are not included in the PPQ program discussed under the CAPs program.

monitors mosquito-related disease outbreaks; has mosquito control guidelines; ArboNET is a national arboviral surveillance system managed by CDC and state health departments (Arboviral disease is a general term used to describe infections caused by a group of viruses spread to people by the bite of infected arthropods such as mosquitoes and ticks.)

With data going back to 1908, the Resistance Database is the most complete database of cases of evolution of resistance in any organism to pesticides (and other xenobiotics) in the world. Michigan State university reports that an "analysis of the resistance cases showed that most of the cases were found in agricultural, forest and ornamental plants (63.6%). Another 34.2% occurred in medical, veterinary and urban pests. Only 1.6% of the cases reported described the development of resistance in natural enemies such as predators and parasitoids, 0.05% in other species as pollinators, and non-target insects. Conventional insecticides (organochlorines, organophosphates, carbamates and pyrethroids) made up about 81.0% of the total resistance cases. In contrast, particularly important is the increase in the development of resistance cases to the groups of compounds with novel chemistries and modes of action such as insect growth regulators, avermectins, neonicotinoids, IGRs, bacterial agents and spynosins, among others. Now scientists and growers from the US and all over the world can analyze resistance events by species, chemical, location, and search literature. Another new feature is space in the data entry system to report pesticide mode of action. In this database resistance reporting is close to real time."

<p>data includes pesticide detections in surface water</p>
<p>Monitoring data confirm pesticide presence. Useful "check" to evaluate accuracy of usage data</p>
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<p>The Office of the Indiana Chemist requires that private applicators or employees keep records of Restricted Use Pesticide (RUP) applications</p>
<p>Pesticide Use Report on National Forest System Lands</p>
<p>Idaho- annual aerial insect detection survey (State map of detection)</p>
<p>Oregon- Effective October 31, 2011, the Oregon Department of Environmental Quality (DEQ) announced a Clean Water Act permit requirement for pesticide applications, in, over, or near state waters. This new permit (a National Pollutant Discharge Elimination System (NPDES) pesticide general permit) is required If pesticide applications are made over, in, or within three feet of state water bodies. The new law is required by a Federal Court order and implemented by DEQ under an agreement with EPA.</p>

States maintain data on management of Rights of Way
N/A

Pounds applied and total expenditures for top 10 AIs by pesticide type and crop type. Based primarily on sales data from registrants
Rotating between pyrethroids and organophosphates each year will help prevent resistance buildup.
http://www.fdot.gov/maintenance/RDW/DOT%20Final%20(3)Turf%20Management%20 Guide%20UF.pdf

In 2009, the Sixth Circuit ruled that (1) biological pesticides and (2) chemical pesticides that leave a residue are pollutants as defined under the CWA and as such are subject to regulations applicable to pollutants. As a result of the Sixth Circuit's decision, point source discharges to waters of the United States from the application of pesticides require NPDES permits as of October 31, 2011. EPA identified four pesticide use patterns that generally include the full range of pesticide application activities that meet this condition, including mosquitoes and other flying insect pests, weeds and algae, animal pests, and forest canopy pests and covered these activities in the NPDES Pesticide General Permit (PGP). However, the PGP does not authorize coverage for (1) point source discharges of pesticides or their degradates to waters already impaired by those specific pesticides or degradates (Tier 2 waters) or (2) discharges to outstanding national resource waters (also known as Tier 3 waters). These discharges would require coverage under individual NPDES permits. Also outside the scope of this permit are terrestrial applications to control pests on agricultural crops (irrigated return flow or agricultural stormwater are exempted), or forest floors. Any use patterns not covered by the PGP would need to obtain coverage under an individual permit or alternative general permit under NPDES if they involve pesticide applications that result in point source discharges to waters of the United States.

What does this data include?
Operations that produce >\$1000 of commodity in a survey year, acres of crops grown per year, per state, and per county
90 use sites, 42 states, 731 AIs
60 agricultural commodities, representing >80% of US ag acreage
consumer, turf, pro. pest management, vegetation management, mosquito control, managed forest, developed, open space developed, Christmas tree, nursery (regional available for some studies)

The 2016 NRCS farmer survey forms completed in the field by NAAS representatives is a 40 page form. Nine pages of the survey cover pest management and pest control practices and additional pages are for recording data on conservation practices that minimize pesticide loss. See:

https://www.nass.usda.gov/Surveys/Conservation_Effects_Assessment_Project/2016/2016CEAPQuestionnaireFinal.pdf

Data presented in publicly available reports provides broad-scale information about pesticides used in large watershed basins; NASS representatives collect NRCS source data from farmer surveys that is rolled up and used in models for the reports, and may be able to provide pesticide usage data at a finer scale based on the data they collect; CEAP is a multi-agency effort to quantify the environmental effects of conservation practices and programs and to develop the science base for managing agricultural lands while promoting environmental quality and wildlife. Assessments in CEAP are carried out at national, regional, and watershed scales. The three main sources that contribute to building the CEAP science base for conservation are:

1. The four national assessments: CEAP-Cropland, CEAP-Grazing Lands, CEAP-Wildlife, and CEAP-Wetlands.
2. The watershed assessment studies: CEAP-Watersheds.
3. The bibliographies and literature reviews.

Location, date, pest, acres treated, amount of pesticide used, sensitive species in proximity. Records reflect if a pesticide use was approved but the application ultimately did not take place.

Information varies with each state. Some states maintain copies of the labels on their sites while others may only define the regulatory processes. Any state restrictions on use should be reflected in the master label for that chemical.

unknown

likely to vary between states

TBD

Unsure

maps, historical chemical usage by crop/region grown

Highly variable - general reports to site-specific pesticide application reports.

Expenditures (sales in dollars), volume (pounds applied), number of pesticides, and number of certified applicators, etc.

Active ingredient name, number of entities reporting and total pounds of pesticide sold.

Pesticide usage for numerous agricultural and non-agricultural uses. Total amount of pesticides used by chemical, by use type - state level (in lbs a.i.). Total amount of all pesticides applied to specific crop types - state-level. Total amount of all pesticides applied in each county, by use type. May be useful for presence/absence information: for example, chlorpyrifos was not reported as being used for mosquito control across the entire state in 2013.

agricultural use includes parks, golf courses, cemeteries, rangeland, pastures, and along roadside and railroad rights-of-way

Each public land management agency managing lands in Florida shall: (a) Determine whether it is managing public lands in Florida that are environmentally sensitive and biologically highly productive. (b) Give written notice to the department and any affected local arthropod control agencies which lands are environmentally sensitive and biologically productive. A list of the mosquito control agencies shall be provided by the department to all land management agencies. Written notice shall include but not be limited to: 1. Aerial photographs or maps depicting the public lands made subject to the notice; 2. A statement of the purpose for which the lands are managed along with a description of ecological data giving rise to the determination of the land management agency; 3. A specification of the potential ecological harm to be guarded against in planning arthropod control on such land with a detailed statement of what reasonably feasible arthropod control measures, if any, the land management agency believes would be suitable for such lands; and 4. Such other pertinent information relative to such determination that provides a better understanding of the land management agency's problems that need to be addressed in an arthropod control plan for the land subject to such determinations. (4) A local arthropod control agency upon receipt of a written notice shall: (a) Prepare a written plan for arthropod control on the environmentally sensitive and biologically highly productive public lands identified in the notice. Such proposed plan shall be submitted to the public land management agency within 45 days from receipt of the notice. 8. The common or chemical name of the pesticides expected to be used. 9. The method of application to be used for each specific product. 10. The rate of application to be used for each specific product. (c) Application shall be timed to be most effective during mosquito activity periods. Application shall not be later than 2 hours after sunrise nor earlier than 2 hours before sunset. Other arthropod treatment and treatments for disease epidemics involving *Aedes aegypti* or *Aedes albopictus* can be made during daytime hours. (d) Equipment shall be calibrated to insure correct particle size and accurate and uniform dosages in accordance with labeling specifications. (e) Pesticide labels prohibit aerial application of adulticides directly to open water of the ocean, gulf, bays or lagoons thereof, therefore, when aircraft release sprays over water targeted to drift over land, wind speed and direction shall be sufficient to carry spray to land. (f) After an aerial adulticiding operation takes place, records shall be maintained for a minimum of 3 years which will include at least the following:

1. The area treated.
2. The application rate and the material used.
3. The equipment and technique used.
4. The name of the pilot in command.
5. The date, time, temperature, and general wind speed and direction.
6. Pretreatment and post-treatment records of mosquito and other arthropod presence including:
 - a. Number and type of trapping and surveillance methods used.
 - b. Trap and surveillance site location.
 - c. Pretreatment and post-treatment trap catches, landing rates or surveillance levels by mosquito species involved.

Usage is reported by ZIP code.

Data provided depends on what is requested and what the group is willing/able to share.

varies from state to state, may include the district, county, pesticide type, gallons or pounds used, and acreage

Each fiscal year, State-Certified Mosquito Control Program districts' application and acreage treated data are compiled and posted. The Florida Department of Agriculture and Consumer Services (FDACS) began compiling this information in 1997. The Florida Mosquito Control Directory Map provides useful information about the State-Approved Mosquito Control Districts of Florida. A publicly available map provides contact information, visualizes the location of the headquarters for each district, and identifies the districts that have aerial spraying capabilities. Of the 67 counties in FL, all but 9 counties have a F.S Chapter 388 state approved mosquito control program: Hamilton, Baker, Suwannee, Lafayette, Gilchrist, Alachua, Marion, Highlands, and Union. Flagler has aerial spraying capacity and appears to have a pending program. Pdf reports are available with summary data on aerial adulticiding, ground applications, and larviciding. Information is broken down by a.i., gallons applied per county, and acres per county. For 2014: Lee and Manatee counties were the only two counties with aerial applications of malathion. There was 260 gallons covering 11,353 acres of aerially applied malathion in Lee County in 2014 and 286 gallons covering 16,352 acres. In 2014 there was a total of 5,115 gallons of malathion over 7 counties for mosquito control.

In addition to following the label directions, the permit requires the applicator to:

- Minimize discharges by using Integrated Pest Management (IPM)
- Submit a Notice of Intent (NOI) prior to discharge (when applicable)
- Demonstrate compliance through written record keeping
- Monitor and report adverse incidents to the EPA Regional Office, State Lead Agency and additionally to the National Marine Fisheries Service (NMFS) or United States Fish and Wildlife Service (FWS), when applicable
- Comply with additional requirements for those discharging into waters containing National marine Fisheries Service (NMFS) listed resources of concern

This is the minimum list of requirements. State-issued permits might include additional steps.

A list of high priority pests that are being monitored and tracked to promote early detection and control; Maps of all regulated quarantine areas, and the potential ranges for some pests; Pest-specific management plans that often include specific pesticide recommendations. Some pesticide uses are covered in consultations with APHIS.

Information about high priority pests and quarantine areas that can be used along with the CAPs data.

data collection and reporting for public health; insecticide resistance reporting

Reports of insecticide resistance that can be searched by pesticide active ingredients, pests, country and other fields; USA reports include states (although the built-in query options do not include queries by state; may only be able to see states listed in USA reports).

water quality data including the presence of pesticides. Presence of pesticides confirm exposure to aquatic habitat.

water quality data including the detection of pesticides. Presence of pesticides confirm exposure to aquatic habitat.

Results from 432 pesticide monitoring studies conducted by federal, state, and local agencies, private industry, and environmental groups water quality data including the presence of pesticides. Presence of pesticides confirm exposure to aquatic habitat in California.

water quality data including the presence of pesticides. Presence of pesticides confirm exposure to aquatic habitat.

All monitoring studies (water quality, sediment, biota, etc) of pesticides and other contaminants submitted to the state of Washington. Presence of pesticides confirm exposure to aquatic habitat.

Data collected from various matrices (e.g., water, tissue, soil) for the purposes of monitoring or a specific site investigation. Each sample contains information on the date of collection and location (lat/long).
1.Name and address of customer and address or location description of site of application, if different; 2.Name and certification number of the person making the application; 3.Date of application (Month, day and year); 4. Type of plants, crop, animals, commodity, stored product, or sites treated and principal pests to be controlled; 5. Acreage, area, or number of plants or animals treated or other appropriate description; 6. Pesticide applied including name of the manufacturer, EPA registration number, and brand name 7. Amount used - expressed as either: A. Concentrate - give total quantity of formulation applied; or B. Diluted mixture - total amount applied and a.i. concentration (percentage). C. The records to be maintained under this section shall be recorded by the thirtieth day from the date of application and be kept and maintained for a period of two (2) years. 355 IAC 4-4-2 Record inspection; availability Sec. 2 a. All required records and information shall upon written or oral request, be made available for inspection and copying by the state chemist or his authorized agent. b. No government agency shall release information obtained under this rule that would directly or indirectly reveal the identity of producers of commodities to which restricted use pesticides have been applied. However, information collected by the state chemist during the course of a complaint or damage investigation shall not be subject to this restriction of release.
pesticide active ingredient, purpose of the use, number of acres applied to, rate applied, year it was applied
Idaho- map of statewide forest detections delimiting where insecticide applications may occur. Program documents indicate pesticides used to control insect outbreaks causing tree damage
Includes daily records of pesticide usage data

maps, procedures, plans ownership, chemical spray applications

If requested on a site-by-site basis, the data provided would depend on the specific request and what the facility is willing to share.

National pesticide usage only; only 10 top AIS
Data provided depends on what is requested and what the group is willing to share.

Information about pesticide uses that are point source discharges leaving residues to waters of the United States for activities not covered by the NPDES PGP where individual permits are obtained.

What does this data not include?
Pesticide usage data for pesticide type only
Small acreage crops, seed treatment (beyond 2014)
statel level data

Usage data associated with specific use sites, or information about pesticide a.i.s used in smaller or more extensive geographical areas than the selected watershed basins.

unknown
TBD

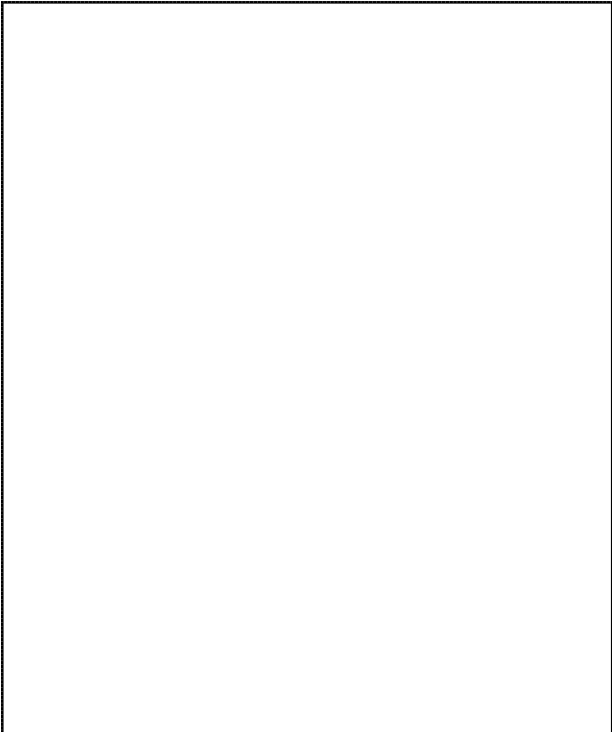
Data on pesticide usage are reported only as pounds applied and not acres treated

Actual usage information
Crop-specific and use specific data does not differentiate between chemicals, only total pesticides applied to that crop or use type during that survey year. County level data only gives total pounds of pesticide applied in that county, does not break down by chemical.

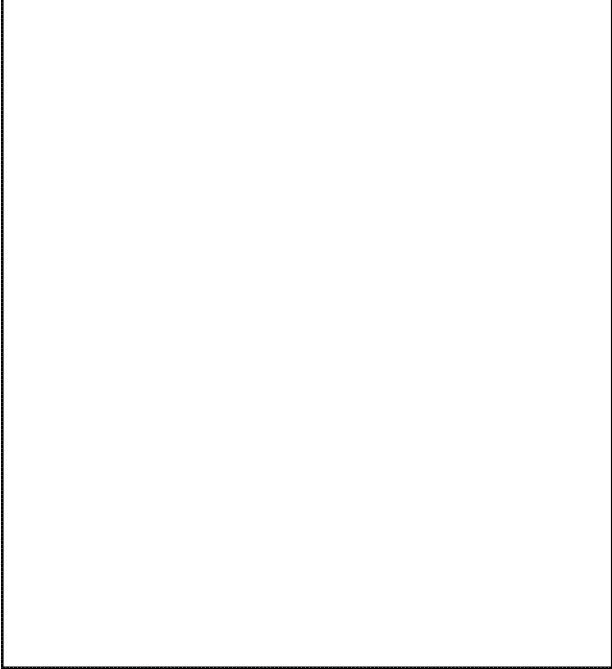
Arthropod control plans included in Land management plans (for FFWCC lands) include approved methods, and pesticides for vector control; however, they do not include data on control practices or pesticide use during the 10 year management period. Plans generally specify records relating to vector control be maintained onsite for at least five years and provide a physical location of where records are stored.

Usage is reported in weight used per zip code. Crop or use type is not reported.

location of acreage applied (excluding CA data), when applied, data for every year
"Prepare and present reports, as needed, on arthropod control activities in the state to other governmental organizations, as appropriate"
Have submitted an inquiry regarding access. Not publicly searchable, but maps of arbovirus detection in mosquito pools, sentinel birds, and dead birds are publicly available from 2003 and present.



Usage data



Usage data

Pesticide usage data

Does not include actual pesticide usage data.
Does not include pesticide usage data. May not reflect current labeled uses. Does not specify source of pesticides, differentiate between pesticidal and other uses for chemicals with both uses
Actual usage information
Actual usage information
Actual usage information

Actual usage information
Non-Restricted Use Pesticides (RUPs) are not included
Not surveyed every year nationally, may not be available in every Forest Service Region, most information is state or national level
Does not include pesticide usage data.
It is not apparent where daily records are kept and how they could be accessed. Needs follow-up

Refined data past national level, lacks information on all AIs
Narrative response to specific questions.

NPDES permits do not cover non-point source pesticide uses. Under CWA section 502(14), agricultural stormwater and irrigation return flow are exempt from NPDES permits. Also, applications that do not reach waters of the United States do not need permit coverage.

Link
https://www.agcensus.usda.gov/
https://www.nass.usda.gov/Surveys/Guide to NASS Surveys/Chemical Use/
Proprietary
Proprietary

<http://ceap-nrcs.opendata.arcgis.com/>

contact database managers to query

http://npic.orst.edu/reg/state_agencies.html;
<http://npirspublic.ceris.purdue.edu/state/indexmap.aspx>

<https://www.acq.osd.mil/eie/afpmb/>

Contact database managers to query.

<p>Example, Washington State: Invasive Species Council (https://invasivespecies.wa.gov/); Ecology WQ reporting/permit (https://fortress.wa.gov/ecy/paris/PermitSearch.aspx); Ag Noxious Weed Control reports (https://agr.wa.gov/PlantsInsects/Weeds/NPDESPermits/)</p>
<p>https://www.epa.gov/sites/production/files/2017-01/documents/pesticides-industry-sales-usage-2016_0.pdf</p>

<http://www.cdpr.ca.gov/docs/mill/nopdsold.htm>
<http://psur.cce.cornell.edu/>

www.nj.gov/dep/enforcement/pcp/pcp-pubs.htm

<http://www.cdpr.ca.gov/docs/pur/purmain.htm>

Criteria for Arthropod Control That May Affect Environmentally Sensitive
and Biologically Productive Public Lands and Other Public Lands
<https://www.flrules.org/gateway/ruleno.asp?id=5E-13.042&Section=0>

(<http://psur.cce.cornell.edu/>)(<http://ai.psur.cornell.edu/>)

www.mosquito.org

for MN: <https://www.mmcd.org/>

http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0300-0399/0388/Sections/0388.46.html 388.46
[Florida Coordinating Council on Mosquito Control; establishment; membership; organization; responsibilities](#)
https://www.freshfromflorida.com/content/download/78667/2317330/Final_Report_May_9_2017.pdf [FLORIDA COORDINATING COUNCIL ON MOSQUITO CONTROL FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES SUMMARY REPORT OF THE MAY 9, 2017 MEETING](#)

<https://gateway.calsurv.org/> Map viewer: <https://maps.calsurv.org/>

<http://www.npic.orst.edu/reg/pgp.html>

<https://www.aphis.usda.gov/aphis/ourfocus/planthealth/pest-detection>

<https://www.aphis.usda.gov/aphis/resources/pests-diseases/hungry-pests/Pest-Tracker>

<https://www.cdc.gov> (see West Nile Virus, Zika, etc.)
https://wwwn.cdc.gov/arboNET/maps/ADB_Diseases_Map/index.html

<https://www.pesticideresistance.org/>

<https://www.waterqualitydata.us/portal/>

<https://water.usgs.gov/nawqa/>

<http://www.cdpr.ca.gov/docs/emon/surfwtr/surfddata.htm>

<http://www.oregon.gov/deq/Data-and-Reports/Pages/default.aspx>

<https://ecology.wa.gov/Research-Data/Data-resources/Environmental-Information-Management-database>

http://www.oisc.purdue.edu/pesticide/private_app_use_records.html
[Private Applicator Use Records 355 IAC 4-4-1.5 Private applicator use records](#)

https://www.fs.usda.gov/detail/r5/forest-grasslandhealth/?cid=fsbdev3_046692

https://www.idl.idaho.gov/forestry/forest-health/id_ads_2017.pdf

http://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/TRACKINGASSESSMENT/ENVIRONMENTALHEALTHASSESSMENT/HWY36/Documents/Oregon%20Regulations%20on%20Pesticide%20Applications_final.pdf

<https://nafoalliance.org/>

http://npic.orst.edu
N/A

https://agribusinessintelligence.informa.com/products-and-services/data-and-analysis/phillips-mcdougall/agraspire

<https://www.epa.gov/npdes/pesticide-applications-1#requirePermit>;
<https://www.epa.gov/npdes/pesticide-permitting>

Data Format	Scale e.g. county, sub-county, state
Electronic database	National, State, County
Electronic database	State
database	State, CRD
narrative	By sector, National, Some regional
	Unknown at this point

Written reports available on-line; basin maps available on-line (GIS data of basin boundaries may be available upon request)	16 subregions. Some subregions are comprised of the majority of one state (Texas Gulf subregion), most represent portions of two or more states.
	State/sub-state
Database, output in spreadsheet	sub-county

Label	depends on the label specifications (may make county level restrictions)
	National
	Sub-county to state-level
Database; output may be available in a spreadsheet or other format TBD based on NPS response.	TBD
Database; output in spreadsheet	Sub-state - BLM field office area.
report	State

	State or lower
Mostly Reports (pdf)	Variable: state, watershed, county, specific location.
Report	National

Report	State
Word tables	Some state data, some county level data
Electronic database, narrative	State, County, Sub-county

<p>Management plans available as pdfs from Florida Fish and Wildlife Conservation Commission's (FFWCC) website cover 10 years. Not every posted management plan has all appendices posted that contain the Arthropod Pest Control Plan. The majority of public lands with arthropod control plans appear to be under the Florida Department of Environmental Protection (BOT) including Division of Recreation and Parks not FFWCC.</p>	<p>For public lands managed under the Florida Fish and Wildlife Conservation Commission, scale is defined by the boundaries of the management area. Lands under management of FDEP (BOT) boundaries similar.</p>
<p>Database, output in spreadsheet</p>	<p>Sub-county</p>

report	Varies. Sub-county, multiple county, State
Reports, as needed	County. All mosquito control districts are county level.
	Map represents mosquito pool, sentinel chicken, and dead bird monitoring across state.

Notices of Intent (NOIs), permits and permittee annual reports.	Sub-county
Downloadable documents such as maps, manuals and plans.	County or sub-county

Online information about priority pests and the threats they pose.	State; specific pest information includes more localized information for some species.
	state, county, sub-county
statistics, maps and reports	National, State, County
online database of pesticide resistance cases worldwide	Varies

database	point data
searchable database by active ingredient	sub-county
searchable database by active ingredient	sub-county
searchable database by active ingredient	sub-county
Searchable database by active ingredient	sub-county
database	sub-county

Searchable database by active ingredient	sub-county
Individual records	sub-state, sub-county
Report	USFS Region (sub state)
Map	sub-county
	State or lower

	State or lower
	NA
Upon request, golf course facilities may provide narrative responses to specific questions or possibly other formats depending on how local data is collected and stored.	sub-county

Online	National
Narrative response to specific questions	

Varies by entity with NPDES program authority, which may be the EPA or an authorized state; databases or reports may be available that include permits issued and permittee annual reports.	Likely to vary based on permitted action and information collected by EPA or the states for permitting based on requirements that vary by geographical area.
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Duplicative (is the exact same information provided by another source)	Level of effort to obtain data	Agriculture	Managed Forests	Developed (e.g. residential, commercial)
	Already have	X		
	Already have	X		
	Already Have	X		
	Already have		X	X
Unknown	Unknown	Potential - do not yet have data		
	High. Will likely require a new ICR.	X		

Unknown whether or not the NASS data from surveys done to support CEAP is unique to that program, or if it is a component of the NASS data we have received.	Reports available. Awaiting response from NRCS regarding data and program info.	X	X	
		x		
No	Low	X	X	X

May be duplicative of Section 3 labels	FESTF indicated this information should be easy for the applicants to produce.	We don't have this information yet, but it could potentially cover all use types and would vary by state.	X	X
No	Medium	Could potentially cover all use types.	X	X
	High	Could potentially cover all use types.	X	X
No	Requires request to NPS, and takes NPS staff time to query the data and develop a report.	X	X	X
In CA-Yes, other states-No	BLM maintains records of pesticide usage on BLM lands. Some usage data are retrievable by searching BLM database (effort low). Other information may require contact (by BLM) with Field offices (effort medium).	x? applications for leafhoppers/curl y top are made to rangeland adjacent to sugar beet and tomato fields		
May be duplicative of SUUM/BE	Low	X		

	High	X		
		X		
	most data is publicly available, but housed in many locations	Could potentially cover all use types.	X	X
Based public and proprietary data sources. Data are duplicate of other sources on the spreadsheet.	Low	X	X	X

	Easy downloadable annual reports	X	X	X
May have some overlap with NASS usage data - would need to compare	Low	X		X
Kynetec has a version of this data.	Low	X	X	X

<p>No, however there is coordination/consensus with local MCDs. The degree of congruence between local MCDs and the Arthropod Pest Control Plan for a public land may be high. More information is needed to understand the extent of overlap.</p>	<p>Management plans on lands managed by FWC: Medium to High. Management plans publicly available online in pdf format, but not all plans have appendices. Effort to obtain management plans for lands managed by FDEP (Florida Division of Environmental Protection) and DPR (Division of Recreation and Parks) may differ.</p>		X	
No	Low	X	X	X

Possibly Kline?	High			
No	Medium			
No	TBD			

Yes, if usage data are available for mosquito control districts within the state or if the state has additional reporting requirements for mosquito control, e.g. Florida.	EPA PGP - medium State PGPs - high		X	
No	Documents are readily available online, but there are many and they take time to review. Other formats may be available upon request from APHIS (e.g., GIS data showing areas with pest pressures where malathion, chlorpyrifos and/or diazinon uses are recommended, with information about how these pesticides may be used).	X	X	

Some of this information is duplicative with information that can be found in the CAPs and PPQ programs; these programs work in concert with each other.	Information is readily available online, but it is not formatted for queries or summary compilations. Other formats may be available upon request from APHIS.	X	X	
	High	X	X	X
No	Low			
No	Low. Relatively easy to pull up records that match provided fields; more difficult and time consuming to review details that could be used to compile a report summarizing specifics of the cases (e.g., uses, geographies affected, etc).	X	X	

	Low			
possibly also within state maintained water quality database if it has one.	Low			
possibly duplicative with Water Quality Data Portal	Low			
possibly duplicative with Water Quality Data Portal	Low			
possibly duplicative with Water Quality Data Portal	Low			
no	Low			

No	Low			
No	High	X	X	X
No	High but already have. Other USFS regions may not keep records of this type. Required some networking and web-site sleuthing		X	
	Low, maps are available online		X	
	High		X	
	Medium		X	

	High			
Probably duplicable with Kynetec data.				
NA	NA			
	High			

	High. Will likely require a new ICR.	X		
	License fee	X		
	High. Will likely require a new ICR.			

No, although some state data could be reported to and made publicly available by EPA and therefore may be available in both places.	High. Will require an ICR to collect data from EPA and delegated states.	X	X	X
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Open space developed (e.g. parks)	Rangeland	Right of way	Golf courses	Nurseries	Mosquito control
X			X		X

	X				
	X				
X	X	X			X

X	X	X	X	X	X
X	X	X	X	X	X
X	X	X	X	X	X
X	X	X			X
	X				

				X	
X	X	X	X	X	X
X	X	X	X	X	X

X	X	X	X	X	X
		X	X		X
X	X	X	X	X	X

X	X				X
X	X	X	X	X	X

					X
					X
					X
					X

					X
	X			X	

				X	
X	X		X	X	
					X - related to mosquito control; confirmed disease reports in humans, sentinel animals, mosquitos, birds, and veterinary cases.
	X			X	

X	X	X	X		X

	X				
		X			

